frost occurred eight miles southeast of that station on the morning of the 27th, causing injury to garden vegetables.

West Virginia.—Mr. S. F. H. Hewit, voluntary observer at Middlebrook, Randolph Co., reports as follows:

Between this place and Valley Head, from two to three miles distant and about six hundred feet lower, there was on June 12th and 13th heavy white frost. Corn was, in places, bitten close to the ground and beans were frozen stiff. I have not yet learned whether any material damage was done or not. On the sea-coast such a frost would have killed the corn and beans. Here it seems that these late frosts simply check, for a time, the growth of corn, when it then takes a new start and finally produces a crop.

Wisconsin.—Fond du Lac, 24th.

Wyoming.—Fort Bridger, 3d, 5th.

ICE.

Ice is reported to have formed during the month at Fort Bidwell, Cal., 5th, and at Carson City, Nev., 6th, 13th.

Table of comparative maximum and minimum temperatures for June.

State or Territory.	Station.	For 1887.		Since establishment of station.			
		Max.	Min.	Max.	Year.	Min.	Year.
		°	°	°		°	
Alabama	Mobile	93.3	62.6	100.0	1882	61.0	1879
Do	Montgomery	102.0	61.6	105.5	1881	58.0	1879, 1877
Arizona	Prescott	97.0	35.6	102.0	1878	32.0	1880
Do	Fort Apache	102.0	39.3	101.0	1883	33.3	1885
Arkansas	Fort Smith	94.8	57.1	101.0	1882	50.0	1882
Do	Little Rock	96.0	59.0	98.0	1882	55.0	1882
California	San Francisco	90.0	48.5	95.2	1883	48.0	1871, 1874
Do	San Diego	78.0	54.0	94.0	1877	50.0	1884
Colorado	Denver	95.9	43.7	99.0	1873	37.0	1883
Do	Pike's Peak	55.8	20.6	63.0	1881	2.0	1882
Connecticut	New Haven	90.2	44.2	92.0	1880	41.4	1884
Do	New London	84.5	47.4	89.0	1880	43.0	1876, 1884
Dakota	Fort Buford	98.4	39.4	107.0	1883	30.0	1883
Do	Yankton	93.9	44.7	97.0	1876	38.0	1879
District of Columbia	Washington City	94.7	50.1	102.5	1874	46.5	1873
Florida	Jacksonville	95.1	64.1	100.5	1880	61.7	1884
Do	Key West	87.1	68.6	99.8	1886	71.2	1882
Georgia	Atlanta	97.0	57.1	94.8	1881	54.0	1879
Do	Savannah	99.7	60.0	100.0	1880	58.5	1884
Idaho	Boisé City	94.7	37.6	98.6	1885	36.0	1882
Illinois	Cairo	95.7	54.3	96.0	1872	50.0	1877
Do	Chicago	96.4	47.9	98.0	1872	40.0	1875
Indiana	Indianapolis	94.0	49.4	96.0	1874	41.1	1885
Indian Territory	Fort Sill	97.0	60.2	105.0	1881	47.0	1879
Iowa	Dubuque	95.6	45.3	98.0	1874	40.0	1877
Do	Des Moines	93.8	45.0	101.4	1886	43.9	1885
Kansas	Dodge City	101.7	55.0	102.0	1880	40.0	1879
Do	Leavenworth	95.8	51.0	99.0	1875	45.0	1882, 1877
Kentucky	Louisville	96.5	52.6	100.0	1874	49.0	1875
Louisiana	New Orleans	91.2	66.2	97.0	1881	65.0	1879
Do	Shreveport	100.7	66.2	104.0	1875	55.0	1877
Maine	Eastport	74.2	41.6	82.0	1884	30.0	1875
Do	Portland	88.6	43.3	94.0	1878	42.0	1875
Maryland	Baltimore	93.7	51.8	97.5	1874	49.0	1873
Massachusetts	Boston	89.0	47.5	98.0	1874	42.0	1884
Michigan	Marquette	90.7	40.5	95.0	1879	31.0	1881
Do	Grand Haven	84.0	48.1	88.0	1874	39.3	1885
Minnesota	Saint Vincent	92.9	34.2	93.0	1883	29.0	1883
Do	Saint Paul	89.6	48.3	94.0	1874	36.0	1885

Table of comparative maximum and minimum temperatures—Continued.

State or Territory.	Station.	For 1887.		Since establishment of station.			
		Max.	Min.	Max.	Year.	Min.	Year.
		°	°	°		°	
Mississippi	Vicksburg	97.3	64.3	101.0	1881	53.0	1879
Missouri	Saint Louis	97.0	57.2	99.0	1881	48.0	1877
Montana	Fort Assinaboine	87.3	36.6	101.0	1883	31.0	1883
Do	Helena	83.4	33.3	95.0	1880	31.0	1880
Nebraska	North Platte	94.0	49.0	101.0	1876	33.0	1876
Do	Omaha	94.0	49.1	98.0	1881	42.0	1877
Nevada	Winnemucca	97.7	29.6	95.0	1881	29.0	1880
New Hampshire	Mount Washington	67.2	33.0	71.0	1878	15.0	1878, 1879
New Jersey	Atlantic City	95.1	53.7	93.0	'74, '80, '81	45.0	1878
New Mexico	Santa Fé	85.5	48.0	92.0	1881	33.0	1880
New York	Buffalo	86.3	51.9	92.0	1878	40.5	1879
Do	New York City	90.1	51.3	95.0	1875	47.0	1878, 1879
North Carolina	Charlotte	101.9	52.8	97.0	1881	51.5	1884
Do	Wilmington	97.9	53.0	100.0	1880	51.0	1884
Ohio	Cincinnati	90.9	52.4	98.5	1874	48.1	1885
Do	Sandusky	91.0	48.9	96.0	1885	45.9	1885
Oregon	Portland	95.3	43.5	99.0	1876	39.0	1875
Do	Roseburg	97.1	38.6	96.5	1878	37.5	1880
Pennsylvania	Pittsburg	93.9	52.2	98.0	1874	39.0	1879
Do	Philadelphia	93.1	53.2	97.0	1874	47.2	1884
Rhode Island	Block Island	80.0	49.2	82.6	1884	46.2	1884
South Carolina	Charleston	99.6	47.4	100.0	1877	58.2	1874
Tennessee	Knoxville	96.0	51.4	96.0	1880	47.0	1878
Do	Memphis	96.6	55.5	100.0	1881	54.0	1879
Texas	Brownsville	91.2	68.5	102.0	1878	63.0	1877
Do	Fort Elliott	94.2	57.3	100.0	1880, 1881	44.0	1880, 1882
Utah	Salt Lake City	.....	.....	100.0	1883	37.0	1875
Virginia	Lynchburg	97.7	49.3	97.0	1874	49.0	1880
Do	Norfolk	95.5	56.5	102.0	1874	53.0	1876, 1884
Washington Ter	Spokane Falls	93.6	38.2	95.4	1883	39.0	1882
Do	Olympia	93.2	36.2	95.0	1878	36.0	1880
Wisconsin	La Crosse	93.1	44.2	98.0	1874	40.0	1876
Do	Milwaukee	92.4	46.7	94.0	1872, 1874	39.8	1885
Wyoming	Cheyenne	90.4	34.0	97.0	1880, 1881	28.0	1876

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature, as observed at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Temperature of water for June, 1887.

Station.	Temperature at bottom.				Mean temperature of the air at station.	Average depth of water, feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
	°	°	°	°	°	
Cedar Keys, Fla	83.8	77.9	5.9	81.5	78.7	8.3
Eastport, Me	48.0	42.0	6.0	44.2	54.3	16.2
Galveston, Tex	87.3	80.0	7.3	82.9	79.9	15.0
Key West, Fla	87.9	79.9	8.0	83.4	79.3	21.1
New London, Conn	65.0	54.3	10.7	59.4	64.3	12.1
New York City	71.6	63.1	8.5	67.7	68.2	15.7
Portland, Me	61.0	49.8	11.2	53.3	61.5	17.5

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for June, 1887, as determined from the reports of about eight hundred stations, is exhibited on chart iii. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitaion is below the normal, and subtracting when above.

The rainfall of June was very heavy along the Gulf coast, in the lower Rio Grande valley, Florida Peninsula, and in southeastern Georgia; it was also very heavy in the extreme northern portions of Dakota and Montana, and adjacent portion of the British Northwest Territory. In the east Gulf states the excess amounted to two inches, and in the Rio Grande Valley it was nearly nine inches; in the latter district the rainfall was about four times as great as the average for June. In New England and the middle Atlantic states slightly more than the average amount of rain fell during the month.

In the Lake region and central valleys the rainfall was below the average, the deficiencies being very marked in the upper lake region and the Ohio and upper Mississippi valleys, where there was less than one-half of the average amount of rain.

The following are some of the most marked departures from the normal precipitation at Signal Service stations:

Above normal.		Below normal.	
	Inches.		*Inches.*
Brownsville, Tex	10.53	Des Moines, Iowa	4.82
Pensacola, Fla	8.42	Memphis, Tenn	4.21
Fort Assinaboine, Mont	7.35	Dubuque, Iowa	3.99
Rio Grande City, Tex	6.80	Grand Haven, Mich	3.92
Southport, N. C	6.43	Keokuk, Iowa	3.88
New Orleans, La	5.10	La Crosse, Wis	3.56
Key West, Fla	4.26	Milwaukee, Wis	3.31
Jacksonville, Fla	3.99	Springfield, Ill	3.06

In the table below is given the total precipitation for the

several geographical districts for the first half of the year—January to June, 1887; also the average for several years, with the excess or deficiency of the current year as shown by comparison with the average of several years:

Precipitation for the six months, January to June.

Districts.	Average for several years.	Total for 1887.	Departure.
	Inches.	*Inches.*	*Inches.*
New England	23.88	24.18	+0.30
Middle Atlantic states	20.99	19.39	−1.60
South Atlantic states	26.33	21.48	−4.85
Florida Peninsula	21.27	19.17	−2.10
East Gulf states	32.96	23.85	−9.11
West Gulf states	24.79	17.34	−7.45
Rio Grande Valley	9.93	18.34	+8.41
Tennessee	31.88	27.85	−4.03
Ohio Valley	24.69	24.08	−0.61
Lower lake region	17.43	17.22	−0.21
Upper lake region	16.12	12.41	−3.71
Extreme northwest	9.57	8.46	−1.11
Upper Mississippi valley	18.91	12.84	−6.07
Missouri Valley	14.41	10.57	−3.84
Northern slope	8.69	9.97	+1.28
Middle slope	11.64	10.49	−1.15
Southern slope	8.98	7.15	−1.83
Southern plateau	4.42	2.86	−1.56
Middle plateau	7.69	5.87	−1.82
Northern plateau	10.95	10.62	−0.33
North Pacific coast region	25.56	35.02	+9.46
Middle Pacific coast region	15.27	11.64	−3.63
South Pacific coast region	8.06	7.47	−0.59

From the above table it will be seen that over nearly the entire country the rainfall for the first half of the year is deficient, and that the deficiency is most marked in the south Atlantic and Gulf states, Tennessee, upper lake region, upper Mississippi and lower Missouri valleys, and on the middle Pacific coast. In New England, the lower lake region, middle Atlantic states, and Ohio Valley nearly the normal amount of rain has fallen, while in the lower Rio Grande valley and on the north Pacific coast a large excess is shown.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month of June for a series of years, the precipitation for June, 1887, and the departures from the average:

Station.	County.	Average precipitation for June.	Number of years.	Precipitation for June, 1887.	Departure.
Arkansas.		*Inches.*		*Inches.*	*Inches.*
Lead Hill	Boone	5.21	5	6.07	+ 0.86
California.					
Sacramento	Sacramento	0.20	21	trace.	− 0.20
Connecticut.					
Canton *	Hartford	4.82	26	6.29	+ 1.47
Hartford*	Hartford	3.10	16	5.55	+ 2.45
Middletown *	Middlesex	3.74	29	6.13	+ 2.39
Wallingford *	New Haven	3.84	30	8.12	+ 4.28
Illinois.					
Mattoon	Coles	5.09	7	1.03	− 4.06
Peoria	Peoria	3.93	32	1.53	− 2.40
Riley	McHenry	4.09	26	1.23	− 2.86
Sandwich	De Kalb	4.16	35	1.77	− 2.39
Sycamore	De Kalb	5.74	7	1.12	− 4.62
Indiana.					
Blue Lick	Clark	4.12	5	2.15	− 1.97
Connersville	Fayette	4.80	5	4.25	− 0.55
Lafayette	Tippecanoe	5.20	8	1.97	− 3.23
Logansport	Cass	3.90	33	2.95	− 0.95
Sunman	Ripley	4.40	4	3.55	− 0.85
Vevay	Switzerland	5.07	21	1.98	− 3.09
Worthington	Greene	4.20	5	0.53	− 3.67
Iowa.					
Cresco	Howard	5.03	14	2.46	− 2.57
Monticello	Jones	4.28	34	1.49	− 2.79
Kansas.					
Independence	Montgomery	5.75	15	4.25	− 1.50
Wellington	Sumner	4.45	9	2.43	− 2.02
Maine.					
Cornish	York	3.34	30	4.32	+ 0.98
Gardiner *	Kennebec	3.27	49	3.42	+ 0.15
Orono *	Penobscot	3.28	19	3.36	+ 0.08
Maryland.					
Cumberland	Alleghany	3.43	16	3.87	+ 0.44
Fallston	Harford	4.25	16	5.14	+ 0.89
New Midway	Frederick	4.44	6	3.84	− 0.60
Massachusetts.					
Amherst *	Hampshire	3.72	52	5.46	+ 1.74
Cambridge *	Middlesex	3.07	46	1.90	− 1.17
Chestnut Hill *	Middlesex	2.86	12	2.08	− 0.78
Framingham *	Middlesex	2.87	13	2.42	− 0.45

Deviations from average precipitation—Continued.

Station.	County.	Average precipitation for June.	Number of years.	Precipitation for June, 1887.	Departure.
Massachusetts—Continued.		*Inches.*		*Inches.*	*Inches.*
Lake Cochituate *	Middlesex	3.38	36	2.58	− 0.80
Ludlow *	Hampden	3.76	12	5.38	+ 1.62
Lynn *	Essex	3.03	13	2.24	− 0.79
Mystic Lake *	Middlesex	2.88	12	2.69	− 0.19
New Bedford *	Bristol	3.17	74	3.15	− 0.02
Somerset	Bristol	3.31	17	4.03	+ 0.72
Springfield *	Hampden	3.87	40	6.44	+ 2.57
Waltham *	Middlesex	3.17	63	2.97	− 0.20
Williamstown *	Berkshire	3.44	19	4.33	+ 0.89
Nevada.					
Carson City	Ormsby	0.84	8	0.46	− 0.02
New Hampshire.					
Concord *	Merrimac	3.30	32	4.56	+ 1.26
Hanover *	Grafton	3.17	23	2.74	− 0.43
New Jersey.					
Dover	Morris	2.59	5	7.06	+ 4.47
South Orange	Essex	3.36	17	5.50	+ 2.14
New York.					
Humphrey	Cattaraugus	5.16	3	2.14	− 3.02
Palermo	Oswego	3.07	33	2.27	− 0.80
Ohio.					
Wauseon	Fulton	4.29	15	3.55	− 0.74
Pennsylvania.					
Dyberry	Wayne	3.21	15	3.91	+ 0.70
South Carolina.					
Statoburg	Sumter	3.40	7	2.10	− 1.30
Texas.					
New Ulm	Austin	3.49	15	2.24	− 1.25
Vermont.					
Newport	Orleans	4.00	13	3.77	− 0.23
Strafford	Orange	3.40	13	4.70	+ 1.30
Virginia.					
Bird's Nest	Northampton	3.22	18	1.65	− 1.57
Dale Enterprise	Rockingham	6.08	7	5.36	− 0.72
Variety Mills	Nelson	3.74	8	3.27	− 0.47
Wytheville	Wythe	3.96	24	3.67	− 0.29
West Virginia.					
Helvetia	Randolph	10.43	10	8.14	− 2.29

* From the "Bulletin of the New England Meteorological Society."

The following notes on precipitation are furnished by the voluntary observers:

Illinois.—Sandwich, De Kalb Co.: the total precipitation for the six months ending June 30th is 5.32 below the normal for the last thirty-five years.

Indiana.—Logansport, Cass Co.: during the last thirty-three years the greatest precipitation for June, 8.99, occurred in 1882, the least, 0.55, in 1863.

Vevay, Switzerland Co.: the total precipitation for the present month, 1.98, is, with one exception, viz., 1.36, in 1873, the least June precipitation that has occurred during the last twenty-one years; the greatest June precipitation in that time, 8.41, was recorded in 1875.

Iowa.—Monticello, Jones Co.: during the last thirty-four years the greatest precipitation for June, 9.02, occurred in 1865; the least, 0.74, in 1857.

Kansas.—Wellington, Sumner Co.: the total precipitation for the six months ending June 30th, is about one-half less than the average for the same months of the last nine years.

Maryland.—Cumberland, Alleghany Co.: the greatest precipitation during the last sixteen years, 5.84, occurred in 1880; the least, 0.86, in 1885.

Fallston, Harford Co.: in the last sixteen years the greatest precipitation for June, 10.21, occurred in 1883; the least, 1.05, in 1873.

New Midway, Frederick Co.: the precipitation of June, 1884, 7.75, is greater than that of any June during the last six years; that of 1886, 2.50, is the least.

New York.—Palermo, Oswego Co.: during the past thirty-three years the largest June precipitation occurred in 1865, 8.80; the least in 1864 and 1870, 0.70.

Ohio.—Wauseon, Fulton Co.: in the past fifteen years the greatest June precipitation, 8.43, occurred in 1881; the least, 1.43, in 1872; the total precipitation for the first six months of 1887, 19.61 (one third of this amount fell during February), is 0.84 above the average of fifteen years; the largest precipitation for the same months in that time, 29.92, occurred in 1876; the least, 9.57, in 1872.

Pennsylvania.—Dyberry, Wayne Co.: the largest precipitation for June in the past fifteen years, 5.38, occurred in 1883; the least, 1.13, in 1873.

South Carolina.—Stateburg, Sumter Co.: during the last seven years the greatest June precipitation, 5.35, occurred in 1886; the least, 1.38, in 1881.

Vermont.—Strafford, Orange Co.: during the past thirteen years the greatest precipitation, 6.30, occurred in 1876; the least, 1.50, in 1885.

Virginia.—Dale Enterprise, Rockingham Co.: the greatest June precipitation during the last seven years, 11.00, occurred in 1884; the least, 1.13, in 1883.

Variety Mills, Nelson Co.: during the past eight years the greatest June precipitation occurred in 1886, 6.21; the least in 1880, 1.46.

Wythville, Wythe Co.: the total precipitation for the six months ending June 30th, 19.91, is 1.87 less than the average for a period of twenty-four years.

Texas.—The following table shows the greatest monthly precipitation from

July, 1872, to June, 1887, with the monthly averages, at New Ulm, Austin Co.:

Month.	Precipitation.				
	Greatest.	Year.	Least.	Year.	Average for fifteen years.
	Inches.		*Inches.*		*Inches.*
July	14.32	1873	0.00	1884	4.33
August	8.38	1878	0.09	1885	3.12
September	15.08	1874	0.90	1872	5.84
October	12.44	1881	0.79	1874	4.13
November	14.93	1873	0.78	1879	5.41
December	16.43	1875	0.44	1880	*4.59
January	10.56	1882	1.09	1887	*4.13
February	10.94	1882	1.06	1885	4.53
March	13.13	1883	1.27	1887	5.07
April	8.00	1873	0.17	1887	3.84
May	12.25	1882	0.05	1886	5.70
June	11.33	1873	0.51	1885	3.49

* Average for fourteen years only; no data given for December, 1884, and January, 1885.

SNOW.

Fort Maginnis, Mont.: on 2d light rain fell from 1.10 to 1.20 p. m.; at the latter hour the rain changed to snow, which continued until 5.15 p. m., melting as it fell.

Fort Assinaboine, Mont.: a heavy snowfall in the Bear Paw Mountains and Sweet Grass Hills was visible from this station on the 4th.

Lakeview, Oregon: light rain and snow began at 1 a. m. and continued until 11.45 a. m. on the 5th, the snow melting as it fell.

Linkville, Oregon.: two inches of snow on the ground at Tule (or Modoc) Lake, twenty miles southeast of Linkville, was reported on the 6th.

Carson City, Nev.: snow fell on the mountains west of this place on the 12th, 13th, and 14th.

Mr. Hiram Arents, voluntary observer at Oroville, Butte Co., Cal., reports under date the 12th, as follows:

At 6 p. m. a heavy hail and rain storm, with thunder and lightning, passed north of Oroville, the course of the storm being from southwest to northeast. On the summit of the Sierra Nevada Mountains, on the Oroville and Susanville road, twelve inches of snow fell.

The following appeared in the "Daily News" (published at Lynchburg, Va.) of June 12th:

Those who were asleep yesterday morning at four o'clock were surprised to learn later in the day that snow fell about that hour, and early risers saw a thin white covering on the Blue Ridge Mountains, which soon disappeared after the sun came out. Old citizens were, however, equal to the emergency, and remembered that snow fell here in 1857, on the 11th of June. The change in temperature was quite sudden, and a cool breeze prevailed during the day.

Snow was also reported to have fallen at—

Pike's Peak, Col., on the 1st, 2d, 9th, 18th, and 24th; the snowfall for these dates aggregating 1.9 inches.

Camp Sheridan, Wyo., 2d, to a depth of 1.5 inches.

Fort Bidwell, Cal., 4th.

At Summit, Cal., snow fell to a depth of 3 inches during the month; date not given.

HAIL.

Under the heading "Local storms" will be found descriptions of the more severe hail storms which have occurred during the month. In addition to these, hail was reported to have fallen in the various states and territories as follows:

Alabama.—Greensborough, 1st.

Arizona.—Fort Bowie, 2d; Fort Apache, 27th; Prescott, 28th.

Arkansas.—Hot Springs, 2d.

California.—Nicolaus and Oroville, 12th.

Colorado.—Las Animas, 4th; Pike's Peak; 20th, 26th to 30th.

Dakota.—Fort Meade, 2d, 29th; Deadwood, 2d, 30th; Fort Buford, 5th; Fort Yates, 16th; Henry and Huron, 18th; Fort Sully, 19th.

Illinois.—Springfield, 1st.

Indian Territory.—Fort Gibson, 2d.

Iowa.—Clinton, 1st; Independence and Bancroft, 18th; Des Moines, 19th.

Table of excessive and greatest monthly precipitation for June, 1887.

Station.	Specially heavy.		Largest monthly.
	Date.	Amt.	Amount.
Alabama.			
Mobile	20, 21	3.20	8.91
Mount Vernon			6.17
Evergreen	27 to 29	3.15	
Connecticut.			
Wallingford			8.12
Canton			6.29
Middletown			6.13
Voluntown	23, 24	2.20	
Hartford	23, 24	3.53	
New London	23, 24	2.23	
New Haven	23, 24	2.74	
Dakota.			
Fort Totten	15, 16	2.55	
Dist. of Columbia.			
Receiv'g Reservoir	23	2.53	
Florida.			
Pensacola	28, 29	11.14	14.11
Manatee	11	2.59	10.88
Limona	12, 13	2.03	10.29
Do	27, 28	4.05	
Jacksonville	26, 27	3.24	9.68
Cedar Keys	27, 28	2.55	8.66
Key West	15, 16	3.70	8.22
Fort Meade	11, 12	5.00	8.08
Merritt's Island			6.47
Sanford	10, 11	2.01	6.12
Duke	26, 27	2.20	
Georgia.			
Savannah	26 to 28	7.68	10.76
Jessup	26 to 28	5.86	7.64
Athens	21	2.40	
Griffin	2	2.19	
Augusta	22 to 24	2.65	
Union Point	2	2.20	
Eastman	26 to 28	3.06	
Illinois.			
Springfield	5	2.13	
Indian Territory.			
Fort Sill	11, 12	2.08	
Iowa.			
Bancroft	11 to 14	4.02	
Kansas.			
W. Leavenworth	1, 2	3.30	11.35
Do	7	2.30	
Do	9, 10	2.05	
Do	24	2.10	
Hilton	7 to 14	7.26	9.63
Topeka	24, 25	2.09	9.57
Bunker Hill	10 to 12	5.50	7.60
Buffalo Park	30	2.00	
Sheridan	8	2.00	
Belleville	11, 12	3.15	
Carneiro	10, 11	2.46	
Dorrance	10	3.75	
Ellis	8	2.00	
Do	13	2.00	
Dodge City	16, 17	3.20	
Louisiana.			
New Orleans	29	5.00	11.33
Lafayette	27 to 29	6.36	9.44
Amité City			8.89
Coushatta	4	2.60	
Opelousas	21, 22	2.13	
Natchitoches	4	3.15	
Alexandria	4	2.66	
Maine.			
Eastport	22	3.18	6.01
Maryland.			
Cumberland	6, 7	2.40	
Great Falls	22, 23	2.17	
Massachusetts.			
Springfield			6.44
Fall River	1, 2	2.20	
Taunton	1, 2	2.08	
Deerfield	23, 24	3.70	
Amherst	22 to 24	3.58	
Michigan.			
Hudson	1, 2	2.64	
Kalamazoo	8	2.53	
Marquette	7, 8	2.19	
Mississippi.			
Biloxi			8.22
Natchez	27, 28	5.01	6.79
Loch Leven			6.70
Macon	2	2.01	
Brookhaven	4	2.00	
Lake	28, 29	2.30	
Oxford	27	2.70	
Missouri.			
Hustonia			10.07
Miami			7.88
Sedalia			7.83
Springfield			6.65
Missouri—Con.			
Pleasant Hill			6.55
Montana.			
Fort Assinaboine	15, 16	4.28	9.33
Nebraska.			
Marquette	10, 11	3.75	7.22
Weeping Water			7.12
De Soto	6, 7	2.85	
Valentine	27, 28	2.12	
New Hampshire.			
Mt. Washington	21 to 24	5.84	9.78
Bristol	22 to 24	4.05	6.78
Woodstock	21 to 23	4.52	6.73
Antrim	20 to 24	4.21	6.32
Ashland	21 to 23	3.76	6.09
Berlin Mills	21 to 23	2.40	
Lake Village	22, 23	3.79	
Wier's Bridge	21 to 23	3.87	
Belmont	23, 24	3.62	
Wolfsborough	23, 24	2.28	
New Jersey.			
Lambertville			10.29
Tenafly			9.57
Imlaystown			8.19
Red Bank			8.06
Hopesville			7.82
Locktown			7.78
Oceanic			7.67
Roseland	22, 23	4.05	7.60
Paterson			7.47
Dover	22, 23	3.74	7.06
Newark			7.00
Union			6.87
Harrisville			6.79
West Point	22, 23	4.00	6.30
New Brunswick			6.28
Moorestown	23, 24	2.66	6.19
Bancocas			6.06
Beverly	22, 23	2.30	
South Orange	22, 23	2.85	
New York.			
White Plains	22, 23	2.63	7.99
New York City	22, 23	3.66	7.70
Boyd's Corners			7.70
Fort Columbus	22 to 24	4.24	7.62
Brooklyn	22 to 24	4.64	7.49
Do	22, 23	2.70	
Setauket	1, 2	2.07	6.57
Menands	22, 23	2.00	
North Carolina.			
Southport			9.74
Wilmington			6.41
Raleigh	22, 23	3.02	6.22
Lenoir	21, 22	3.80	
Weldon	22, 23	2.07	
Goldsborough	22, 23	2.20	
Charlotte	1, 2	2.42	
Ohio.			
West Milton			6.75
Pennsylvania.			
Germantown	23	3.60	7.40
Philadelphia	22, 23	3.12	6.81
West Chester	22, 23	3.42	6.72
Easton	22, 23	2.60	6.10
Wilkesbarre			6.06
Quakertown	22, 23	2.54	
Erie	6	3.64	
South Carolina.			
Spartanburg	20	2.00	
Aiken	1, 2	2.05	
Anderson	2	3.60	
Hardeeville	23, 24	2.12	
Do	27	2.03	
Tennessee.			
Manchester	21	2.60	
Texas.			
Brownsville	20, 21	8.45	13.80
Paris			8.76
Galveston	12, 13	4.44	8.28
Ringgold, Fort	20 to 23	4.36	8.17
Rio Grande City	20, 21	4.52	8.08
Houston	25	3.07	7.81
Comfort	8	2.16	
Cuero	29	5.50	
Tyler	4	2.00	
Longview	4	2.15	
Vermont.			
Strafford	23	2.00	
Virginia.			
University of Va.			7.04
Dale Enterprise	20, 21	2.37	
West Virginia.			
Helvetia	8, 9	3.12	8.14
Parkersburg	7, 8	2.14	

Kansas.—Allison and Wellington, 8th; Emporia, 12th; Concordia, 16th; Wakefield, 20th; Elk Falls and Independence, 24th; Wilson, 29th.

Louisiana—Shreveport, 2d.

Maryland.—Baltimore, 18th.

Michigan.—Kalamazoo and Lansing, 17th; Port Huron, 22d.

Minnesota.—Moorhead, 19th.

Montana.—Poplar River, 9th, 10th, 14th; Fort Custer, 15th.

Nebraska.—Fort Robinson, 1st; Hay Springs, 1st, 19th; Tecumseh, 9th; Valentine, 26th.

New Hampshire.—Mount Washington, 10th, 24th, 26th.

New Jersey.—Salem, 21st.

New Mexico.—Santa Fé, 21st.

North Carolina.—Reidsville, 18th.

Ohio.—Columbus, 5th; Wauseon, 20th.

Oregon.—Fort Klamath, 5th; Linkville, 9th.

Pennsylvania.—State College, 2d.

Tennessee.—Knoxville, 1st; Ashwood, 1st, 3d; Nashville, 10th.

Virginia.—University of Virginia, 1st; Dale Enterprise, 20th.

Wyoming.—Cheyenne, 1st, 4th; Fort McKinney, 4th.

SLEET.

The observer at Pike's Peak, Colo., reports sleet to have fallen during the month on the following dates: 10th, 14th, 20th, 21st, 23d, 24th, 25th, 27th to 29th.

DROUGHT.

The severe drought which prevailed in previous months continued in some sections of the country, and, in some localities not previously affected by drought, the lack of rainfall during this month caused crops to suffer serious injury.

The following reports relate to the drought of June:

Arkansas.—Little Rock, 19th: the corn crop in this part of the state is suffering from the effects of drought.

Florida.—Pensacola, 3d: up to this date the season has been very dry; ponds in this vicinity that were never known to fail are now almost dry, and large numbers of fish have died. The drought in this section was ended by the heavy rains of the 12th and subsequent dates.

Georgia.—Milledgeville, Baldwin Co.: at the close of the month the weather was very dry; all crops, except cotton, have suffered serious injury.

Illinois.—Cambridge, Henry Co., 30th: owing to the protracted drought which prevailed in this state during the month drinking water in many towns has become polluted, and the dry beds of creeks have been covered with dead fish. Fires burned to a considerable extent in the woods, by which farmers have lost much cattle.

Sandwich, De Kalb Co.: during June the most protracted drought that has ever been known here prevailed in this and the adjacent counties.

Charleston, Coles Co., 30th: the month has been the driest ever known in this locality.

Rock Island, Rock Island Co., 30th: the farmers in this region report that owing to the severe drought it is feared that great injury will result to crops.

The "Monthly Weather Review" of the Illinois Weather Service for June, 1887, states:

A drought prevailed from the 9th until the end of the month, broken only by light local showers in the northern and central divisions of the state from the 18th to 20th, and in the southern division on the 24th and 25th.

Indiana.—Vevay, Switzerland Co., 30th: the continuous drought is becoming more severe every day; creeks and small streams are dry, and cisterns low.

Laconia, Harrison Co., 30th: the latter part of the month has been very dry, and vegetation suffered in consequence.

Iowa.—Mason City, Cerro Gordo Co., 7th: at this date the drought in this vicinity continues. The month of May, and thus far June, has been the driest known in northern Iowa since 1876. Streams are drying up, and herders find it difficult to obtain water for cattle.

The "Chicago Inter-Ocean" of June 19th contained the following:

MASON CITY, IOWA, *June* 18.—Rain fell in this section to-day to the depth of one and one-quarter inches. Corn has never been known to grow so rapidly as it has in the past week. Small grain is beginning to head out. The straw is short, but the crop will be much better than was at first anticipated. Oats will be a three-quarter crop; clover and timothy are almost an entire failure; millet and Hungarian will be planted for late feeding for cattle.

CEDAR RAPIDS, IOWA, *June* 18.—Reports from one hundred stations in northern Iowa, southern Dakota, and Minnesota show a general two hours' rain, worth thousands of dollars to crops. Small grain is safe from drought now, and corn promises a big crop. Hay is so light that farmers in many places are selling cattle on account of no feed.

Dubuque, 27th: the weather is clear and dry; crops are being ruined by the protracted drought; pastures have dried up, and stock is suffering.

Keokuk, 29th: the rain of this date broke the drought and was of great benefit to crops in this vicinity.

Fort Madison, Lee Co.: the weather during the month was very dry, and vegetation suffered much injury; on the 30th a much-needed rain fell, which greatly revived the crops.

Cedar Rapids, Linn Co.: the month of June has been very dry in this locality; although frequent passing showers have occurred there has not been a good soaking rain for several months; Cedar River at this point at the end of the month was the lowest known in eighteen years. Corn is looking well, but other crops are suffering from the dry weather.

Kansas.—Ninnescah, Kingman Co.: all crops, except corn, have suffered from drought during the month; a light rain fell on the 30th.

Kentucky.—Louisville: the drought which prevailed in this section during June has been the most protracted that has been known for many years. The total rainfall for the month, 1.79 inches, is the smallest recorded in June during the last fifteen years. But little rain fell after the 10th.

Michigan.—Thornville, Lapeer Co., 30th: the corps in this county were injured by drought during June; it is feared that the early-planted potatoes will prove a failure unless rain falls at an early date.

Grand Haven, 30th: the month has been unusually dry, and the complaint of farmers and gardeners throughout this section is general; small fruits, potatoes, and other crops have suffered great damage; the total precipitation for the month, 0.55 inch, is the least June rainfall that has been recorded since the establishment of the signal office in 1871; of the total rainfall (0.55 inch) for the month, 0.46 inch fell on the 1st.

Mississippi.—Oxford: the rainfall of the 27th broke a protracted drought in this vicinity; the crops were greatly benefited; previous to the above date no rain had fallen since the 11th.

Ohio.—West Milton, Miami Co.: drought prevailed in this section during the month; at the close of the month the pastures and crops were greatly in need of rain.

Yellow Springs, Greene, Co.: but very little rain fell in this locality after the 6th; corn has not been injured, but garden vegetables and fruits have suffered considerably.

South Carolina.—Providence, Sumter Co.: a dry, hot spell prevailed in this vicinity previous to the 20th; although it was of short duration considerable injury was done to gardens. A good rain fell on the 20th.

Kirkwood (near Camden), Kershaw Co., 30th: although abundant rains have fallen during the month within ten or fifteen miles of this place, the crops in this immediate vicinity have suffered serious injury from drought.

Tennessee.—Ashwood, Maury Co., 30th: unusually dry weather prevailed during the month; the total rainfall was only 1.26 inches.

Austin, Hawkins Co., 30th: a protracted drought prevails in this locality; crops (particularly corn, tobacco, and millet) are suffering from the effects of drought.

Wisconsin.—La Crosse, 6th: in portions of the surrounding country where the soil is sandy, complaints are general concerning the disastrous effects of drought; grasses of all kinds are suffering serious injury.

Lancaster, Grant Co.: the drought which prevailed in this vicinity since May was broken by the rains of the 18th and 20th. The drought caused serious injury to the various crops, especially hay.

Delavan, Walworth Co., 30th: the drought caused serious injury to pastures and crops of various kinds in this county.

Elkhorn, Walworth Co., 30th: the continued drought has caused great damage to crops in this county; in some parts of the county but little rains has fallen during the last seven weeks.

Burlington, Racine Co., 30th: the drought has practically destroyed all crops in this vicinity. The leaves have fallen from the willow trees in the lowlands, and tassels are coming out on the corn, although it is but two feet high.

La Crosse, 30th: the month of June, like May, is characterized by its high mean temperature (which is only exceeded by that of June, 1873) and the unusually small amount of rainfall, 0.98 inch, making it the driest June ever known. The severe drought prevailed from the beginning to the end of the month; it was not checked by the light showers of the 12th, 13th, 14th, 18th, and 20th. The condition of crops is diversified; while hay and winter wheat are being harvested fifteen days earlier than usual, with a very poor yield, the condition of corn is very good.

Chicago, Ill., 30th: the drought which prevails in the northern and central tiers of counties in this state is not more severe than it is in Wisconsin. In this latter state fruit and crops are nearly destroyed, and in some towns the authorities have taken steps to insure the economical use of water. Reports from northwestern Iowa state that the drought in that region has been broken by recent showers.

The "New York Herald" of July 2d contained the following:

The outcry that comes from the Northwest on account of the drought in the "wheat belt" is not groundless. The growing grain has suffered seriously from the June deficiency of rain, which must tell upon the yield of the harvest in a considerable area of the country.

Happily, however, the cry of distress from the Northwest was answered yesterday by local rains in the upper Mississippi valley and near the western lakes. The showers were not heavy enough in the drought-stricken districts to satisfy the parched and dusty fields, but they were helpful, and the meteorological conditions now give some promise of further rainfall in the regions of severest drought within the next two days.

WINDS.

The most frequent directions of the wind during June, 1887, are shown on chart ii by arrows flying with the wind; on the Atlantic coast north of Virginia they were southerly, and from Virginia southward they were mostly from the north; in the Gulf States and central valleys, southerly; in the Lake region, Rocky Mountain districts, and on the Pacific coast they were variable.

HIGH WINDS (in miles per hour).

Wind-velocities of fifty or more miles per hour, (on mountain stations at or exceeding seventy miles) other than the maximum velocities for the month, which are given in the table of miscellaneous data:

Fort Totten, Dak., 50, s., 26th.
Pike's Peak, Colo., 72, sw., 5th; 72, w., 26th.
Mount Washington, N. H., 72, w., 16th; 70, nw., 17th.

LOCAL STORMS.

Pamplin City, Appomattox Co., Va.: a destructive hail and wind storm passed over this section on the afternoon of the 1st; it appears to have been most severe at a point five miles west of this place, where the crops were seriously injured.

Charlotte, N. C.: quite a severe storm, accompanied by hail, occurred at this place between 5 and 6 p. m. on the 1st. The wind attained a maximum velocity of forty miles per hour at 5.28 p. m.

Knoxville, Tenn.: heavy rain, with hail at intervals, fell from 11.15 a. m. to 12.20 p. m., and from 1.40 to 5.25 p. m. on the 1st. This storm was the severest that has occurred at this place during the current year, and considerable damage was done to crops in the surrounding country.

Marquette, Mich.: the storm which occurred during the night of the 7–8th caused considerable damage to streets, sewers, and unfinished buildings in this city.

Mr. A. Pendleton, voluntary observer at Nicolaus, Sutter Co., Cal., furnishes the following report of a hail storm of remarkable severity which occurred at that place on the 12th:

The hail storm of the 12th was the most violent and disastrous that ever occurred here. The length of time during which hail was precipitated was over three hours (beginning at 1.30 p. m.), a feature of the storm which, also, has no precedent in this vicinity, if in the state. When done falling nothing in the shape of vegetation was free from the traces of the storm. Whole fields of barley were stripped entirely clean of the heads, and nothing was left standing but the bare straw. In other fields the grain was knocked flat to the ground, with only, here and there, a head remaining on the stalk. With wheat fields the effect was the same, except that the destruction was not quite so complete, owing, most likely, to its being not quite so far advanced as the barley. What fruit was not pounded off the trees was picked full of holes, so that it resembled the effect of a charge of shot. Corn was stripped as with a knife, and every sort of vegetable suffered. Chickens, birds, rabbits, gophers, young pigs, etc., were found lifeless in quantities after the storm.

The temperature rapidly fell to 50°, and the ground soon became white with hail. For two hours the hail and rain continued to fall with unabated vigor until it lay three inches deep on the ground, and the streets were like rivers. In places like the intersection of roofs the hail piled up to the depth of eighteen inches, and could have been gathered by the ton. It varied in size from peas to walnuts, and was of all shapes, and generally bearing the characteristic, noticed before, of being frozen solid on one side and imperfectly congealed on the other.

At 3 p. m. an attempt was made to reach the rain-gauge, which is situated on a roof twenty-four feet from the ground. But the wind (which at that time had increased to sixty miles per hour), rain, and hail drove the observer back, but not until he had seen the gauge full and running over. Its capacity is 1.70 inches, so more than that amount had fallen in an hour and a half. It is safe to say that the amount precipitated during the storm was three inches, nearly an inch an hour for the three and a half hour's fall. The wind during the last hour fell to fifteen miles, and hauled to east,, the temperature rising at 4 p. m. to 53°.

Observers situated a mile or more from the river saw two clouds, one seemingly above the other, which came together over the town and adjacent country at the time of the greatest fall. For a distance of five miles below town to the same distance above, the hail was felt in its severity, extending back from the river a varying distance of from a half a mile to two miles. Nearly every growing thing in the limits of this district suffered more or less, the loss, in all probability, reaching $50,000. It is fortunate that the storm spent its fury before reaching the extensive wheat fields east of the river, as the damage would have been incalculable. Most of them got a severe drenching, but escaped with a loss variously estimated at from five to ten per cent. and the delay of harvesting it. Doubtless the storm will go on record as the severest ever experienced in California in the month of June.

Dodge City, Kans.: a thunder-storm began at 6 p. m. on the 16th and continued until 10.20 p. m. The rainfall was very heavy, amounting to 3.00 inches in two hours and forty minutes, and caused much damage by flooding streets and cellars. Small hail fell at intervals during the storm.

Port Huron, Mich.: from 5.10 to 9.20 p. m. on the 17th a thunder-storm, accompanied by hail, prevailed at this place, the wind reaching a maximum velocity of thirty-six miles per hour, from the west, at 5.54 p. m. Several windows were broken by the hail in this city, and farmers from the surrounding country state that crops were considerably injured by hail.

Hudson, Lenawee Co., Mich.: a very severe wind storm from the northwest occurred during the afternoon of the 17th, causing much damage to trees.

Henry, Codington Co., Dak.: gardens and crops to the east of this place were damaged by a hail storm which occurred on the 18th.

Baltimore, Md.: a severe storm, accompanied by hail and high wind, occurred between 4 and 5 p. m. on the 18th. About half an inch of rain fell in a few minutes, causing some light damage.

Petersburg, Va.: reports from Northampton county, N. C., state that during the night of the 18–19th a violent storm caused much damage in that county to fruit trees, fences, barns, and other out-buildings. The very heavy rain caused much injury to crops.